1. A circuit to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time; comprising:

means for a set of individual small capacitors;

means for a set of switching devices to continually switch on said capacitors in parallel, one for each of said small capacitors;

means to linearly control the switching function for each of said set of continuous switching devices;

means to generate a set of controlling signals, directly depending on the tuning voltage input, one for each of the capacitor switching stages;

means to generate a set of threshold values, one for each of the capacitor switching stages; and

means to provide a tuning voltage, dedicated for the voltage controlled capacitance change.

2. The circuit of claim **1** wherein said capacitors are discrete capacitor components.

3. The circuit of claim **1** wherein said capacitors are manufactured on planar carrier.

4. The circuit of claim **1** wherein said capacitors are integrated on a semiconductor substrate, but on a separate substrate than said switching devices.

5. The circuit of claim **1** wherein said capacitors are integrated on a semiconductor substrate and on the same substrate as said switching devices and amplifiers.

6. The circuit of claim **1** wherein said capacitors are manufactured as a Metal-Oxide structure.

7. The circuit of claim **1** wherein said capacitors are manufactured as a junction capacitor.

8. The circuit of claim **1** wherein said switching device is a transistor.

9. The circuit of claim **8** wherein said switching device is a P-MOS or N-MOS junction FET.

10. The circuit of claim **8** wherein said switching device is a CMOS FET.

11. The circuit of claim **1** wherein said means to linearly control the switching function for each of a set of continuous switching devices connect directly to said

means to generate a set of controlling signals, directly depending on the tuning voltage input.

12. The circuit of claim **1** wherein said means to linearly control the switching function for each of said continuous switching devices use a circuit like a voltage follower to connect to said means to generate a set of controlling signals, directly depending on the tuning voltage input.

13. The circuit of claim **1** wherein said means to generate a set of controlling signals, directly depending on the tuning voltage input, one for each of said capacitor switching stages, is implemented a chain of resistors.

14. A circuit to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time; comprising:

means for a set of individual small capacitors;

means for a set of switching devices to continually switch on said capacitors in parallel, one for each of said small capacitors;

means to linearly control the switching function for each of said continuous switching devices;

means for a set of amplifier stages to produce said linear controls for said switching functions;

means to generate a set of threshold values, one for each of said amplifier stages; and

means to provide a tuning voltage, dedicated for the voltage controlled capacitance change, for all of said amplifier stages.

15. The circuit of claim **14** wherein said amplifier is an operational amplifier.

16. The circuit of claim **14** wherein said means to linearly control the switching function for each of said continuous switching devices is provided by the output of said operational amplifier.

17. The circuit of claim **14** wherein said means to generate a set of threshold values, one for each of said amplifier stages, is implemented as a chain of resistors.

18. The circuit of claim **14** wherein said means to provide a tuning voltage, dedicated for the voltage controlled capacitance change, is a signal connected to all amplifier inputs at the same time.

19. A method to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time generate; comprising:

providing means for a set of individual small capacitors, means for a set of switching devices to continually switch on said capacitors in parallel, one for each of said small capacitors, means to linearly control the switching function for each of said continuous switching devices, means to generate a set of controlling signals, directly depending on the tuning voltage input, one for each of the capacitor switching stages; means to generate a set of threshold values, one for each of said capacitor switching stages, means to provide a tuning voltage, dedicated for the voltage controlled capacitance change, for all of said capacitor switching stages

continually switching on one of said continuous switching devices in order to switch one of said small capacitors in parallel to the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said continuous switching devices;

generate a set of controlling signals, directly depending on the tuning voltage input, to produce the linear control signal for said continually switching operation;

generating a set of threshold values, one for each of said capacitor switching stages; and

supplying a tuning voltage, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages.

20. The method of claim **19** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to discrete capacitor components.

21. The method of claim **19** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to capacitors manufactured on a planar carrier.

22. The method of claim **19** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to capacitors integrated on a semiconductor substrate.

23. The method of claim **19** wherein linearly controlling the switching operation applies to a transistor as said continuous switching device.

24. The method of claim **23** wherein linearly controlling the switching operation applies to a P-MOS or N-MOS junction FET as said continuous switching device.

25. The method of claim **23** wherein linearly controlling the switching operation applies to a CMOS FET as said continuous switching device.

26. The method of claim **19** wherein amplifying the difference of the capacitance tuning voltage and the reference voltage of each amplifier stage to produce the

linear control signal for said continually switching operation is performed by said operational amplifier.

27. The method of claim **19** wherein generating a set of threshold values, one for each of said amplifier stages uses a chain of resistors.

28. The method of claim **19** wherein supplying a tuning voltage, dedicated for the voltage controlled capacitance change, to all of said amplifier stages uses a signal connected to all amplifier inputs at the same time.

29. A method to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time generate; comprising:

providing means for a set of individual small capacitors, means for a set of switching devices to continually switch on said capacitors in parallel, one for each of said small capacitors, means to linearly control the switching function for each of said continuous switching devices, means for a set of amplifier stages to produce said linear controls for said switching functions, means to generate a set of threshold values, one for each of said amplifier stages, means to provide a tuning voltage, dedicated for the voltage controlled capacitance change, for all of said amplifier stages

Continually switching on one of said continuous switching devices in order to switch one of said small capacitors in parallel to the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said continuous switching devices;

comparing the difference of the capacitance tuning voltage and the threshold voltage of each capacitor switching stage to produce the linear control signal for said continually switching operation;

generating a set of threshold values, one for each of said amplifier stages; and

supplying a tuning voltage, dedicated for the voltage controlled capacitance change, for all of said amplifier stages.

30. The method of claim **29** wherein comparing the difference of the capacitance tuning voltage and the threshold voltage of each capacitor switching stage to produce the linear control signal for said continually switching operation is performed by said operational amplifier.